

The 5th International Conference on Economics and Social Sciences
Fostering recovery through metaverse business modelling
June 16-17, 2022
Bucharest University of Economic Studies, Romania

**Analysis of Foreign Trade with the Main Categories
of Agro-Food Products, Parallel Romania - Italy**

Georgiana Raluca LĂDARU¹, Mariarosaria LOMBARDI²,
Marco PLATANIA³, Ionuț Laurențiu PETRE^{4*}

DOI: 10.24789788367405072-010

Abstract

This paper aims to study the dynamics and structure of foreign trade in agro-food products according to the combined nomenclature of Romania and Italy. In this regard, with the help of statistical data taken from databases: the National Institute of Statistics, for Romania, and the International Trade Center, for Italy, the dynamics of exports, imports, and, at the same time, the trade balance were analysed. The degree of concentration of both imported and exported products was further analysed to determine whether or not there was a concentration on a particular chapter of the Combined Nomenclature.

Keywords: Romania, Italy, foreign trade, trade balance.

JEL Classification: Q17, F10.

1. Introduction

The analysis of external trade is an extremely important topic, especially in today's socio-economic-political context. This article aims to highlight a comparative analysis of foreign trade in agro-food products from Romania and Italy.

The existence of trade was necessary because people began to communicate with each other; initially people were content with very little and worked hard to produce everything they needed; over time, as civilization developed, their needs increased, only by exchange to satisfy (Pațac, 2008).

International trade is an independent branch of the economy that includes commercial transactions or cooperative economic and technical science actions with

¹ Bucharest University of Economic Studies, Bucharest, Romania, raluca.ladaru@eam.ase.ro.

² University of Foggia, Foggia, Italy, mariarosaria.lombardi@unifg.it.

³ University of Catania, Catania, Italy, marco.platania@unict.it.

⁴ Bucharest University of Economic Studies, Bucharest, Romania, laurentiu.petre@eam.ase.ro.

* Corresponding author.

foreigners in goods, works, services, financial transactions, insurance, tourism and, in general, any conduct or business (Vişan, 1999).

2. Problem Statement

According to the literature, Gavrilescu (2019) finds that Romania's international agricultural and food trade has changed significantly in terms of trade policy, as well as the geographic focus and composition of imports and exports. Economic and political reforms have led to major changes in the functioning of the agro-food sector and the agro-food chain, resulting in a severe imbalance between domestic supply and demand; as a result, imports far outnumber exports (International Trade and Regional Integration, n.d.).

According to the conclusions reached by the authors Nica & Stoian (2018), the trend of imports is constant while the development of exports oscillates, so the dynamics of the trade balance is given by the trend. *„Concerning the import of agro-food products, their growth rate was higher than that of exports with agro-food products, the trade balance of this product category being deficient.”*

According to Rusali (2010), who conducted an overview of foreign trade in agro-food products in Romania, the author concluded that the results show a decrease in domestic performance in the face of increasing external competitiveness, with significant implications for both the food industry and the agricultural sector, requiring a redesign of market strategies. It also states that the competitiveness rating of Romanian food products shows a commercial disadvantage compared to EU products, reliance on imports of processed products and animal origin, and low competitiveness of the processing sector is the main disadvantage for achieving higher export earnings (Rusali, 2010; Pătărlăgeanu et al., 2020).

According to Caiazza & Volpe (2014) „agro-food industry has great relevance in Italy”. Studying competitiveness, the authors concluded that strategic actions to support the internationalization process of agro-food companies must be based on innovation to improve quality and international certification. The main drivers behind the internationalization strategy are the need for more markets and the search for opportunities to increase profits. In the process of internationalization, the industry faces the threat of unfair competition and counterfeiting. Other issues depend on cultural differences that affect competition due to differences in product quality and imagery (Caiazza, Vople, 2012).

3. Research Questions / Aims of the Research

This research aims to identify the dynamics of imports and exports of agro-food products from Romania and Italy through a comparative analysis, as well as to determine the balance of trade for these products.

At the same time, we want to determine the degree of concentration of imports and exports for these categories of products, both in Italy and in Romania, and this last part contributes to the formulation of the research question, namely, what is the degree of concentration of imports and exports of agro-food products in Romania and in Italy.

Making also a hypothesis to the research question, formulated above, we consider that the degree of concentration of exports is higher than that of imports, both for Romania and Italy; but also, the hypothesis that the degree of concentration of Italy's foreign trade is lower than that of Romania.

4. Research Methods

The aim of this paper is to make a comparative analysis of foreign trade in agro-food products in Romania and Italy. To this end, the dynamics of imports and exports were analysed using statistical data, respectively, the National Institute of Statistics for Romania's trade and the International Trade Centre for Italy's trade. In view of the European Union rules, Romania and Italy also classify marketed products according to the Combined Nomenclature, so the first 24 chapters of the nomenclature, i.e. the first 4 sections of the same nomenclature, were considered agro-food products.

The gap between exports and imports was used to determine and analyse the evolution of the trade balance. At the end of the study, the aim was to carry out an analysis in order to determine the degree of concentration of imports and exports by product category, so for this analysis the GINI coefficient was determined, using the following formula (Dorfman, 1979; Abounoori, McCloughan, 2003):

$$\text{Gini Coefficient} = \sqrt{\frac{n \cdot \sum_{i=1}^n p_i^2 - 1}{n-1}}, \text{ where:}$$

pi – share of each indicator observation in the total;

n – number of observable units.

5. Findings

According to the Combined Nomenclature, the first 24 chapters represent the totality of agro-food products, so the dynamics of imports, exports and the determination of the trade balance in these 24 chapters will be analysed.

Table 1. Dynamics of agro-food imports into Romania, thousands of euros

Group	Category	Imports				
		2016	2017	2018	2019	2020
1	Live animals	165,129	179,025	180,031	184,781	183,945
2	Meat and edible meat offal	645,828	760,266	820,597	940,884	910,482
3	Fish and crustaceans, molluscs and other aquatic invertebrates	174,145	195,503	207,138	207,505	196,529
4	Dairy produce; birds' eggs; natural honey; edible products of animal origin, not elsewhere specified or included	401,736	497,252	501,506	576,786	640,640
5	Products of animal origin, not elsewhere specified or included	53,916	56,571	64,525	69,697	64,037
6	Live trees and other plants; bulbs, roots, and the like; cut flowers and ornamental foliage	115,000	129,113	133,086	153,320	151,242
7	Edible vegetables and certain roots and tubers	365,037	410,293	424,054	517,167	484,696

Group	Category	Imports				
		2016	2017	2018	2019	2020
8	Edible fruit and nuts; peel of citrus fruit or melons	563,740	638,723	639,209	653,460	704,893
9	Coffee, tea, maté and spices	243,096	248,235	241,740	253,426	271,060
10	Cereals	592,125	467,766	324,849	397,554	703,190
11	Products of the milling industry; malt; starches; inulin; wheat gluten	105,247	102,253	100,988	113,656	112,524
12	Oil seeds and oleaginous fruits; miscellaneous grains, seeds and fruit; industrial or medicinal plants; straw and fodder	315,696	368,008	429,075	397,420	461,403
13	Lac; gums, resins and other vegetable saps and extracts	27,859	29,646	22,486	28,293	31,255
14	Vegetable plaiting materials; vegetable products not elsewhere specified or included	1,588	1,411	1,125	1,843	1,538
15	Animal or vegetable fats and oils and their cleavage products; prepared edible fats; animal or vegetable waxes	189,372	191,964	172,245	173,686	202,038
16	Preparations of meat, of fish or of crustaceans, molluscs or other aquatic invertebrates	149,902	189,719	212,313	249,327	272,087
17	Sugars and sugar confectionery	280,959	288,299	264,659	302,793	270,065
18	Cocoa and cocoa preparations	267,062	276,621	294,578	350,116	333,604
19	Preparations of cereals, flour, starch or milk; pastrycooks' products	404,462	452,899	490,207	546,305	566,941
20	Preparations of vegetables, fruit, nuts or other parts of plants	279,825	297,731	332,003	374,265	385,016
21	Miscellaneous edible preparations	407,387	451,983	498,020	547,390	555,812
22	Beverages, spirits and vinegar	323,234	359,616	396,827	494,456	498,385
23	Residues and waste from the food industries; prepared animal fodder	394,517	458,488	506,088	532,568	575,989
24	Tobacco and manufactured tobacco substitutes	322,199	371,748	377,697	364,418	355,128

Source: National Institute of Statistics (NIS).

As can be seen in Table 1, Romania's imports of agro-food products increased during the review period for most of the chapters analyzed in the nomenclature. The highest import value was recorded in 2019 for the Meat and edible meat offal category, with an import value of 940.88 million euros. On the contrary, the category with the lowest imports was Vegetable plaiting materials with a minimum value recorded in 2018 of €1.13 million.

On average, for the last five years, the situation is as follows: Meat and edible meat offal ranks first with an average annual import value of 815.6 million euro, followed by Edible fruit and nuts; peel of citrus fruit or melons with an average annual value of 640 million euro, and dairy produce ranks third with an average import value of 523.5 million euro.

Looking at the dynamics, of the 24 chapters in the nomenclature, only two show a decreasing average annual rate, namely the categories: Vegetable plaiting materials with an annual rate of -0.8% and Sugars and sugar confectionery with an average annual rate of -0.98%, while the other 22 chapters record increases in imports, the highest being for the category Preparations of meat, of fish or of crustaceans, molluscs, or other aquatic invertebrates with an average annual increase of 16%.

Table 2. Dynamics of Romania's agro-food exports, thousand euros

Group	Category	Exports				
		2016	2017	2018	2019	2020
1	Live animals	373,203	424,290	375,833	437,135	405,621
2	Meat and edible meat offal	238,586	281,216	263,617	238,229	195,179
3	Fish and crustaceans, molluscs and other aquatic invertebrates	18,799	18,870	20,923	20,438	20,733
4	Dairy produce; birds' eggs; natural honey; edible products of animal origin, not elsewhere specified or included	155,824	189,041	198,846	199,789	198,859
5	Products of animal origin, not elsewhere specified or included	27,555	32,844	36,008	32,473	24,779
6	Live trees and other plants; bulbs, roots and the like; cut flowers and ornamental foliage	2,821	3,230	2,847	2,445	2,416
7	Edible vegetables and certain roots and tubers	86,407	139,661	97,063	95,632	93,612
8	Edible fruit and nuts; peel of citrus fruit or melons	54,038	65,354	66,217	61,345	79,418
9	Coffee, tea, maté and spices	24,929	26,073	24,046	28,352	29,537
10	Cereals	2,097,250	1,980,693	2,175,910	2,585,351	2,169,442
11	Products of the milling industry; malt; starches; inulin; wheat gluten	26,866	17,450	12,685	16,963	18,684
12	Oil seeds and oleaginous fruits; miscellaneous grains, seeds and fruit; industrial or medicinal plants; straw and fodder	1,141,696	1,267,076	1,210,098	1,083,265	955,996
13	Lac; gums, resins and other vegetable saps and extracts	1,027	1,058	1,057	1,434	953
14	Vegetable plaiting materials; vegetable products not elsewhere specified or included	2,459	1,417	940	1,363	1,157
15	Animal or vegetable fats and oils and their cleavage products; prepared edible fats; animal or vegetable waxes	194,056	211,079	224,211	224,491	194,977
16	Preparations of meat, of fish or of crustaceans, molluscs or other aquatic invertebrates	137,418	146,147	169,786	182,503	195,264
17	Sugars and sugar confectionery	63,602	57,124	47,222	40,610	42,148
18	Cocoa and cocoa preparations	76,588	84,316	83,074	116,348	106,839
19	Preparations of cereals, flour, starch or milk; pastrycooks' products	154,263	172,458	187,817	217,453	221,890
20	Preparations of vegetables, fruit, nuts or other parts of plants	55,072	67,062	66,444	67,603	73,142
21	Miscellaneous edible preparations	167,303	181,694	172,166	183,287	196,462
22	Beverages, spirits and vinegar	118,439	133,497	152,036	164,616	156,964

Group	Category	Exports				
		2016	2017	2018	2019	2020
23	Residues and waste from the food industries; prepared animal fodder	181,295	175,198	220,430	236,580	234,038
24	Tobacco and manufactured tobacco substitutes	769,738	729,705	692,197	947,308	1,375,940

Source: National Institute of Statistics (NIS).

In terms of Romania's exports over the same period of time, there is quite a big difference compared to imports, in the sense that the value of exports is lower than that of imports. The highest value of Romania's exports, by chapters of the nomenclature, was recorded in 2019, for Cereals with a value of 2.585 billion euros. In the opposite direction, the lowest value of exports for a single chapter of the nomenclature was recorded for Vegetable plaiting materials, in 2018, being 940 thousand euros.

In terms of annual average, the highest export values in the last five years were recorded in the following sections: Cereals, with an average annual export value of €2.2 billion, followed by Oil seeds and oleaginous fruits; miscellaneous grains, seeds, and fruit; industrial or medicinal plants; straw and fodder, with an average annual export value of €1.13 billion, and in third place was Tobacco and manufactured tobacco substitutes with an average annual export value of €902.98 million. In terms of average annual value over the last five years, the last-ranked category is Lac; gums, resins, and other vegetable saps and extracts, with an average annual export value of €1.1 million.

Analysing the dynamics, out of the 24 chapters of the nomenclature, for Romania's exports, 17 register a positive dynamic and 7 register a negative dynamics. Of the categories with the highest annual increases, the first two are Tobacco and manufactured tobacco substitutes, with an average annual increase of 15.6%, followed by Edible fruit and nuts; peel of citrus fruit or melons with an average annual growth rate of 10.1%. At the other end of the scale, the slowest annual growth rates were recorded in the categories: Vegetable plaiting materials, with an average annual rate of -17.17%, and Sugars and sugar confectionery, with an average annual rate of -9.77%.

Table 3. Dynamics of the trade balance for agro-food products in Romania, thousands of euros

Group	Category	Trade balance				
		2016	2017	2018	2019	2020
1	Live animals	208,074	245,265	195,802	252,354	221,676
2	Meat and edible meat offal	-407,242	-479,050	-556,980	-702,655	-715,303
3	Fish and crustaceans, molluscs and other aquatic invertebrates	-155,346	-176,633	-186,215	-187,067	-175,796
4	Dairy produce; birds' eggs; natural honey; edible products of animal origin, not elsewhere specified or included	-245,912	-308,211	-302,660	-376,997	-441,781

Group	Category	Trade balance				
		2016	2017	2018	2019	2020
5	Products of animal origin, not elsewhere specified or included	-26,361	-23,727	-28,517	-37,224	-39,258
6	Live trees and other plants; bulbs, roots and the like; cut flowers and ornamental foliage	-112,179	-125,883	-130,239	-150,875	-148,826
7	Edible vegetables and certain roots and tubers	-278,630	-270,632	-326,991	-421,535	-391,084
8	Edible fruit and nuts; peel of citrus fruit or melons	-509,702	-573,369	-572,992	-592,115	-625,475
9	Coffee, tea, maté and spices	-218,167	-222,162	-217,694	-225,074	-241,523
10	Cereals	1,505,125	1,512,927	1,851,061	2,187,797	1,466,252
11	Products of the milling industry; malt; starches; inulin; wheat gluten	-78,381	-84,803	-88,303	-96,693	-93,840
12	Oil seeds and oleaginous fruits; miscellaneous grains, seeds and fruit; industrial or medicinal plants; straw and fodder	826,000	899,068	781,023	685,845	494,593
13	Lac; gums, resins and other vegetable saps and extracts	-26,832	-28,588	-21,429	-26,859	-30,302
14	Vegetable plaiting materials; vegetable products not elsewhere specified or included	871	6	-185	-480	-381
15	Animal or vegetable fats and oils and their cleavage products; prepared edible fats; animal or vegetable waxes	4,684	19,115	51,966	50,805	-7,061
16	Preparations of meat, of fish or of crustaceans, molluscs or other aquatic invertebrates	-12,484	-43,572	-42,527	-66,824	-76,823
17	Sugars and sugar confectionery	-217,357	-231,175	-217,437	-262,183	-227,917
18	Cocoa and cocoa preparations	-190,474	-192,305	-211,504	-233,768	-226,765
19	Preparations of cereals, flour, starch or milk; pastrycooks' products	-250,199	-280,441	-302,390	-328,852	-345,051
20	Preparations of vegetables, fruit, nuts or other parts of plants	-224,753	-230,669	-265,559	-306,662	-311,874
21	Miscellaneous edible preparations	-240,084	-270,289	-325,854	-364,103	-359,350
22	Beverages, spirits and vinegar	-204,795	-226,119	-244,791	-329,840	-341,421
23	Residues and waste from the food industries; prepared animal fodder	-213,222	-283,290	-285,658	-295,988	-341,951
24	Tobacco and manufactured tobacco substitutes	447,539	357,957	314,500	582,890	1,020,812
	TOTAL	-619,827	-1,016,580	-1,133,573	-1,246,103	-1,938,449

Source: Authors' calculations based on NIS data.

Analyzing the trade balance, i.e., the difference between the value of exports and imports, for Romanian agro-alimentary products, the following can be observed. In the last five years, three chapters have been completely in surplus, namely: Cereals, Oil seeds and oleaginous fruits and Tobacco and manufactured tobacco substitutes, and 2 chapters out of 24 have been partially in surplus, namely Vegetable plaiting materials and Animal or vegetable fats and oils and their cleavage products.

At the total level, it can be seen that the trade balance for agro-food products, i.e. for the 24 chapters of the nomenclature, is in deficit in each of the last five years, ranging from -619 million euros in 2016 to almost -2 billion euros in 2020.

The largest deficit was recorded in 2020 for the Meat and edible meat off al category, which was € 715 million, and the largest surplus was recorded in the cereal category in 2019 being of € 2.188 billion.

Looking at the average over the last five years, the situation changes slightly, with five categories showing a surplus, namely Cereals with an average annual surplus of €1.7 billion, followed by Oil seeds and oleaginous fruits with €737.3 million, Tobacco and manufactured tobacco substitutes with €544.7 million, Live animals with €224.6 million and Animal or vegetable fats and oils and their cleavage products with €23.9 million. At the other end of the scale are Meat and edible meat offal with a deficit of 572.2 million euro and Edible fruit and nuts; peel of citrus fruit or melons with a deficit of 574.7 million euro.

In order to carry out a comparative analysis in terms of external trade in agro-food products, a similar analysis was carried out for Italy.

Table 4. Dynamics of agro-food imports in Italy, thousands of euro

Group	Category	Imports				
		2016	2017	2018	2019	2020
1	Live animals	1,451,539	1,563,889	1,569,384	1,205,664	1,485,933
2	Meat and edible meat offal	4,273,821	4,493,510	4,373,618	4,694,436	4,137,451
3	Fish and crustaceans, molluscs and other aquatic invertebrates	4,413,911	4,576,300	4,669,898	4,679,241	3,935,680
4	Dairy produce; birds' eggs; natural honey; edible products of animal origin, not elsewhere specified or included	3,339,043	3,756,983	3,758,810	3,842,986	3,490,802
5	Products of animal origin, not elsewhere specified or included	200,809	210,776	226,187	256,028	223,027
6	Live trees and other plants; bulbs, roots and the like; cut flowers and ornamental foliage	542,488	56,303	51,919	397,215	470,687
7	Edible vegetables and certain roots and tubers	1,525,013	1,623,281	1,527,259	1,781,757	1,634,125
8	Edible fruit and nuts; peel of citrus fruit or melons	3,096,890	3,143,431	3,133,745	3,415,403	3,452,442
9	Coffee, tea, maté and spices	1,702,789	1,785,471	1,645,602	1,611,272	1,476,072
10	Cereals	2,811,206	2,856,588	2,863,445	3,069,324	3,149,849
11	Products of the milling industry; malt; starches; inulin; wheat gluten	273,305	297,594	32,887	327,798	336,275

Group	Category	Imports				
		2016	2017	2018	2019	2020
12	Oil seeds and oleaginous fruits; miscellaneous grains, seeds and fruit; industrial or medicinal plants; straw and fodder	1,245,480	1,270,588	1,315,760	1,476,730	1,568,663
13	Lac; gums, resins and other vegetable saps and extracts	183,714	193,047	198,839	212,283	203,495
14	Vegetable plaiting materials; vegetable products not elsewhere specified or included	22,121	21,049	17,055	17,747	19,168
15	Animal or vegetable fats and oils and their cleavage products; prepared edible fats; animal or vegetable waxes	3,773,463	4,069,970	3,575,755	3,462,911	3,583,394
16	Preparations of meat, of fish or of crustaceans, molluscs or other aquatic invertebrates	1,418,900	1,502,215	1,550,742	1,516,140	1,553,423
17	Sugars and sugar confectionery	1,042,547	1,091,444	901,416	91,489	948,038
18	Cocoa and cocoa preparations	1,145,857	1,141,714	1,076,248	1,129,407	1,199,831
19	Preparations of cereals, flour, starch or milk; pastrycooks' products	1,385,014	1,452,692	1,495,197	1,504,541	1,409,900
20	Preparations of vegetables, fruit, nuts or other parts of plants	1,188,015	1,201,221	1,209,402	1,246,824	1,176,186
21	Miscellaneous edible preparations	1,113,801	1,123,306	1,163,195	1,191,268	1,170,580
22	Beverages, spirits and vinegar	1,623,514	1,746,210	1,914,833	1,985,148	1,811,621
23	Residues and waste from the food industries; prepared animal fodder	1,918,666	1,945,125	2,029,701	1,957,701	1,960,810
24	Tobacco and manufactured tobacco substitutes	2,102,603	2,093,435	2,125,742	2,062,427	1,925,043

Source: International Trade Center (ITC).

As can be seen in Table 4, Italy's imports of agro-food products have increased over the period under review for a good part of the chapters analysed in the nomenclature. The highest import value was recorded in 2017 for the category Animal or vegetable fats and oils and their cleavage products, with an import value of € 4.69 billion. Conversely, the category that recorded the lowest imports was Vegetable plaiting materials with a minimum value recorded in 2018 of € 17 million.

On average, over the last five years, the situation is as follows: Fish and crustaceans, molluscs and other aquatic invertebrates is in first place with an average annual import value of EUR 4.455 billion, followed by Meat and edible meat off al with an average annual value of EUR 4.395 billion, and Animal or vegetable fats and oils and their cleavage products in third place with an average import value of EUR 3.693 billion.

Analyzing from the perspective of dynamics, among the 24 chapters of the nomenclature, nine record a decreasing average annual rate, the first categories, according to the largest decrease being: Vegetable plaiting materials with an annual rate of -3.52% and S Coffee, tea, maté and spices with an average annual rate of

-3.5%, while the other 15 chapters record increases in imports, the highest being for the category Oil seeds and oleaginous fruits with an average annual increase of 5.9%.

Table 5. Italy's agro-food export dynamics, thousands of euros

Group	Category	Exports				
		2016	2017	2018	2019	2020
1	Live animals	51,846	47,367	47,655	39,617	32,948
2	Meat and edible meat offal	2,121,278	2,181,284	2,098,108	2,133,082	2,063,582
3	Fish and crustaceans, molluscs and other aquatic invertebrates	413,012	431,002	429,398	425,921	384,041
4	Dairy produce; birds' eggs; natural honey; edible products of animal origin, not elsewhere specified or included	2,807,681	3,138,297	3,284,829	3,698,216	3,623,999
5	Products of animal origin, not elsewhere specified or included	115,166	138,787	158,875	159,217	159,970
6	Live trees and other plants; bulbs, roots and the like; cut flowers and ornamental foliage	757,099	834,279	885,379	899,571	906,317
7	Edible vegetables and certain roots and tubers	1,528,985	1,547,699	1,525,390	1,603,105	1,582,537
8	Edible fruit and nuts; peel of citrus fruit or melons	3,557,388	3,694,523	3,410,661	3,351,608	3,574,141
9	Coffee, tea, maté and spices	1,457,190	1,510,673	1,503,359	1,614,780	1,557,341
10	Cereals	703,739	757,241	626,636	644,405	723,998
11	Products of the milling industry; malt; starches; inulin; wheat gluten	308,146	34,668	372,846	393,779	405,708
12	Oil seeds and oleaginous fruits; miscellaneous grains, seeds and fruit; industrial or medicinal plants; straw and fodder	506,876	518,501	544,764	593,948	602,731
13	Lac; gums, resins and other vegetable saps and extracts	231,649	196,114	225,402	267,754	301,812
14	Vegetable plaiting materials; vegetable products not elsewhere specified or included	4,652	4,789	54	6,068	7,166
15	Animal or vegetable fats and oils and their cleavage products; prepared edible fats; animal or vegetable waxes	2,148,279	2,144,417	2,061,122	1,968,933	2,103,532
16	Preparations of meat, of fish or of crustaceans, molluscs or other aquatic invertebrates	1,005,708	1,075,329	1,116,187	1,166,868	1,239,484
17	Sugars and sugar confectionery	359,552	366,444	338,428	335,548	325,293
18	Cocoa and cocoa preparations	1,535,089	1,803,527	1,817,437	1,944,515	1,900,033
19	Preparations of cereals, flour, starch or milk; pastrycooks' products	4,446,215	4,668,335	4,858,399	5,427,472	5,849,580
20	Preparations of vegetables, fruit, nuts or other parts of plants	3,187,980	3,256,077	3,400,611	3,534,903	3,765,764
21	Miscellaneous edible preparations	1,986,236	2,267,598	2,473,281	2,642,949	2,815,827

Group	Category	Exports				
		2016	2017	2018	2019	2020
22	Beverages, spirits and vinegar	7,953,662	8,544,071	9,065,224	9,709,996	9,532,706
23	Residues and waste from the food industries; prepared animal fodder	788,911	879,406	942,792	968,977	1,045,587
24	Tobacco and manufactured tobacco substitutes	446,109	948,404	909,572	1,551,367	1,801,143

Source: International Trade Center (ITC).

With regard to exports from Italy during the same period, there is no difference from imports in that the value of exports is close to that of imports. The highest value of Italy's exports, by chapters of the nomenclature, was recorded in 2019, for Beverages, spirits and vinegar, with a value of € 9.71 billion. In the opposite direction, the lowest value of exports for a single chapter of the nomenclature was recorded for Vegetable plaiting materials, in 2018, being € 54 thousand.

In terms of annual average, the highest export values over the last five years were recorded in the following categories: Beverages, spirits, and vinegar, with an average annual export value of € 8.96 billion, followed by Preparations of cereals, flour, starch, or milk; pastrycooks' products, with an average annual export value of €5.05 billion, and in third place was Edible fruit and nuts; peel of citrus fruit or melons with an average annual export value of €3.517 billion. In terms of average annual value over the last five years, the last ranked category is Vegetable plaiting materials, with an average annual export value of €4.55 million.

Analysing the dynamics, out of the 24 chapters of the nomenclature, for Italy's exports, 19 show positive dynamics and 5 show negative dynamics. Of the categories with the highest annual increases, the first two are Vegetable plaiting materials, with an average annual increase of 11.4%, followed by Miscellaneous edible preparations with an average annual growth rate of 9.11%. At the other end of the scale, the slowest annual growth rates were recorded for Live animals, with an average annual rate of -10.7%, and Sugars and sugar confectionery, with an average annual rate of -2.5%.

Table 6. Trade balance dynamics for agro-food products in Italy

Group	Category	Trade balance				
		2016	2017	2018	2019	2020
1	Live animals	-1,399,693	-1,516,522	-1,521,729	-1,166,047	-1,452,985
2	Meat and edible meat offal	-2,152,543	-2,312,226	-2,275,510	-2,561,354	-2,073,869
3	Fish and crustaceans, molluscs and other aquatic invertebrates	-4,000,899	-4,145,298	-4,240,500	-4,253,320	-3,551,639
4	Dairy produce; birds' eggs; natural honey; edible products of animal origin, not elsewhere specified or included	-531,362	-618,686	-473,981	-144,770	133,197

Group	Category	Trade balance				
		2016	2017	2018	2019	2020
5	Products of animal origin, not elsewhere specified or included	-85,643	-71,989	-67,312	-96,811	-63,057
6	Live trees and other plants; bulbs, roots and the like; cut flowers and ornamental foliage	214,611	777,976	833,460	502,356	435,630
7	Edible vegetables and certain roots and tubers	3,972	-75,582	-1,869	-178,652	-51,588
8	Edible fruit and nuts; peel of citrus fruit or melons	460,498	551,092	276,916	-63,795	121,699
9	Coffee, tea, maté and spices	-245,599	-274,798	-142,243	3,508	81,269
10	Cereals	-2,107,467	-2,099,347	-2,236,809	-2,424,919	-2,425,851
11	Products of the milling industry; malt; starches; inulin; wheat gluten	34,841	-262,926	339,959	65,981	69,433
12	Oil seeds and oleaginous fruits; miscellaneous grains, seeds and fruit; industrial or medicinal plants; straw and fodder	-738,604	-752,087	-770,996	-882,782	-965,932
13	Lac; gums, resins and other vegetable saps and extracts	47,935	3,067	26,563	55,471	98,317
14	Vegetable plaiting materials; vegetable products not elsewhere specified or included	-17,469	-16,260	-17,001	-11,679	-12,002
15	Animal or vegetable fats and oils and their cleavage products; prepared edible fats; animal or vegetable waxes	-1,625,184	-1,925,553	-1,514,633	-1,493,978	-1,479,862
16	Preparations of meat, of fish or of crustaceans, molluscs or other aquatic invertebrates	-413,192	-426,886	-434,555	-349,272	-313,939
17	Sugars and sugar confectionery	-682,995	-725,000	-562,988	244,059	-622,745
18	Cocoa and cocoa preparations	389,232	661,813	741,189	815,108	700,202
19	Preparations of cereals, flour, starch or milk; pastrycooks' products	3,061,201	3,215,643	3,363,202	3,922,931	4,439,680
20	Preparations of vegetables, fruit, nuts or other parts of plants	1,999,965	2,054,856	2,191,209	2,288,079	2,589,578
21	Miscellaneous edible preparations	872,435	1,144,292	1,310,086	1,451,681	1,645,247
22	Beverages, spirits and vinegar	6,330,148	6,797,861	7,150,391	7,724,848	7,721,085
23	Residues and waste from the food industries; prepared animal fodder	-1,129,755	-1,065,719	-1,086,909	-988,724	-915,223
24	Tobacco and manufactured tobacco substitutes	-1,656,494	-1,145,031	-1,216,170	-511,060	-123,900
	TOTAL	-3,370,045	-2,225,293	-328,212	1,948,878	3,984,765

Source: Authors' calculations based on ITC data.

An analysis of the trade balance, i.e. the difference between the value of exports and imports, for agro-food products from Italy shows the following. In the last five years, 7 chapters have been completely in surplus and 6 other chapters out of 24 have been partially in surplus.

At the total level, it can be observed that the trade balance for agro-food products, i.e. for the 24 chapters of the nomenclature, is in deficit in the first three years analysed (2016-2018) with values ranging from - 328.2 million euros to - 3.37 billion euros. In the last two years, the balance became in surplus, reaching a value of 3.985 billion euros in the last year analysed. Averaged over the five years analysed, there is a surplus of 2 million euros per year.

The largest deficit was recorded in 2019 for the category Fish and crustaceans, molluscs and other aquatic invertebrates at €4.25 billion and the largest surplus was recorded in the category Beverages, spirits and vinegar in 2019 at €7.725 billion.

Averaged over the last five years, the situation changes slightly, with five categories showing a surplus, namely Beverages, spirits and vinegar with an average annual surplus of €7.15 billion, followed by Preparations of cereals, flour, starch or milk; pastrycooks' products with €3.6 billion, Preparations of vegetables, fruit, nuts or other parts of plants with €2.225 billion, Miscellaneous edible preparations with €1.285 billion and Cocoa and cocoa preparations with €661.5 million. At the other end of the scale are Fish and crustaceans, molluscs and other aquatic invertebrates with a deficit of 4.038 billion euro and Meat and edible meat offal with a deficit of 2.275 billion euro.

Following this analysis of foreign trade, for the two main forms of trade, i.e. imports and exports, it is possible to determine, with the help of the Gini coefficient, the degree of concentration of imports and exports for both Romania and Italy. A high value of the coefficient implies a high degree of concentration, which would mean that either imports or exports orbit around certain main chapters, while the rest of the chapters in the nomenclature would have a low weight, and conversely, a low value would imply a low or non-existent degree of concentration, which would imply that imports or exports are evenly distributed for each chapter, with somewhat similar weights.

Table 7. Determination of Gini coefficients for the value of imports and exports of Romania and Italy and their average over the last 5 years

GINI coefficient	2016	2017	2018	2019	2020	Average
Romania						
Imports	0.124	0.125	0.129	0.130	0.132	0.128
Exports	0.374	0.352	0.366	0.381	0.358	0.366
Italy						
Imports	0.148	0.155	0.156	0.159	0.143	0.152
Exports	0.231	0.231	0.235	0.235	0.230	0.233

Source: Authors' calculations.

As it can be seen from Table 7, for Romania's imports, the Gini coefficients for each year from 2016-2020 tend more towards zero, ranging from 0.124 to 0.132, with an annual average of 0.128. These values imply a low degree of concentration, to non-existent, which is not necessarily a good thing. The lack of a degree of concentration actually means that the weight of each chapter of the nomenclature in terms of imports by Romania is similar to that of another chapter, which leads to the idea that Romania imports a similar level of each group of agro-food products, which is not sustainable.

Analysing the degree of concentration of the value of Romania's exports, by chapters of the nomenclature, one can observe Gini coefficient values ranging from 0.352 to 0.381, with an annual average of 0.366, which is close to the middle of the range (of 0.5), i.e., there is some concentration in terms of Romania's export of agro-food products, again a less favourable situation, in the sense that Romania excels at exporting only in certain chapters of the nomenclature.

The situation is similar in Italy, but at a slightly different level, the average concentration ratio for imports recorded by Italy being 0.152 (with annual variations ranging from 0.143 to 0.159), which is higher than in the case of Romania, thus with a slightly higher degree of concentration, a slightly better situation in the sense that agro-food imports are higher for certain categories, but not by much.

Italy is in a much better position when it comes to agro-food exports, with an average annual concentration ratio of 0.233 (ranging from 0.23 to 0.235), which shows that the weights of each chapter in the nomenclature are similar when it comes to exports, representing a sustainable development in this respect.

6. Conclusions

As regards Romania's imports of agro-food products, they are increasing for most of the chapters analysed in the Combined Nomenclature, except for two categories. Therefore, Romania records significant increases in imports, which is less sustainable. On the other hand, in terms of exports of agro-food products, there are quite a number of chapters (seven) for which there are decreases in the value of exports, while the level between exports and imports is much higher. Therefore, this situation leads to a deficit trade balance in Romania, which is increasingly unbalanced, reaching a deficit of almost €2 billion last year.

As far as Italy's foreign trade is concerned, it can be seen that, in terms of dynamics, imports have decreased for nine of the 24 chapters, thus Italy is trying to decrease its dependence on imports, while, on the other hand, export dynamics show increases for 19 of the 24 chapters analysed, as Italy is increasing its competitiveness in this area. This situation is also observed in the analysis of the trade balance, while in the first three years of the period analysed there was a trade deficit, in the last two years analysed (2019 and 2020) Italy's trade in agro-food products recorded a surplus, reaching a trade balance value of almost 4 billion euros.

Although it is natural for a country to import every product needed for consumption by its population, and at the same time, given culture, tradition, climate, customs and other exogenous and endogenous factors, exports are directed towards

certain categories/chapters of the nomenclature, and therefore the degree of concentration of exports is higher than that of imports, the situation in Romania is far too lagged, with very low Gini coefficients for imports, which leads to a lack of concentration (in other words, Romania imports almost every agro-food product in a similar way), and the degree of concentration for exports is quite high (in other words, Romania relies on exporting a few categories/chapters of agro-food products).

References

- [1] Caiazza, R., Volpe, T. (2012). The global agro-food system from past to future. *China-USA Business Review*, 11(7), pp. 919-929.
- [2] Caiazza, R., Volpe, T. (2014). Agro-food firms' competitiveness: made in Italy in the world. *International Review of Management and Business Research*, 3(3), p. 1790.
- [3] Dorfman, R. (1979). A Formula for the Gini Coefficient. *The Review of Economics and Statistics*, 61(1), pp. 146-149, <https://doi.org/10.2307/1924845>.
- [4] Abounoori, E., McCloughan, P. (2003). A simple way to calculate the Gini Coefficient for grouped as well as ungrouped data. *Applied Economics Letters*, 10(8), pp. 505-509, DOI: 10.1080/1350485032000100279.
- [5] Gavrilescu, C. (2019). An analysis of the trade balance for the main agri-food products. *Agrarian Economy and Rural Development - Realities and Perspectives for Romania*, 10, pp. 26-34.
- [6] International Trade and Regional Integration, *Analysis of the competitiveness of agricultural trade in the Americas*, Inter-American Institute for Cooperation on Agriculture, www.iica.int.
- [7] International Trade Centre (ITE), www.intracen.org.
- [8] National Institute of Statistics (NIS), www.insse.ro.
- [9] Nica, M., Stoian, M. (2018). Foreign Trade in Agri-food Products – Current Approaches. *“Ovidius” University Annals, Economic Sciences Series*, XVIII(1), pp. 211-216.
- [10] Pațac, F. (2008). *Istoria comerțului și turismului*, Editura Eurostampa, Timișoara, p. 16. [*The history of trade and tourism*, Eurostampa Publishing House, Timișoara].
- [11] Rusali, M. (2010). Post-Accession Trends Of Romania's Agri-Food Trade. *Agricultural Economics and Rural Development, New Series*, VII(2), p. 267-276.
- [12] Pătărlăgeanu, S.R., Miclea, A., Sacală, M.D., Teodor, C., Dinu, M., Piștalu, M., Constantin, M., Lazăr, V. (2020). *Studiu privind balanța comercială cu produse agroalimentare a României în perioada 2015-2020 [Study on the Romanian Trade Balance with Agri-food Products during 2015-2020]*, Bucharest ASE Publishouse, <https://www.ceeol.com/search/book-detail?id=917212>.
- [13] Vișan, D. (1999). *Contabilitatea în comerțul exterior*, Ediția a II-a, Editura Economică, București, [*Accounting in foreign trade*, Second Edition, Economic Publishing House, Bucharest], p. 13.